REMARKS

Claims 1-15 are pending in the application. Claims 21-23 have been added, leaving claims 1-15 and 21-23 for consideration upon entry of the present Amendment. As will be discussed in detail below, it is believed that the application is in condition for allowance.

Claims 1-15 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Applicant's admitted prior art figures 1A-1B and their description in pages 1-4 of the specification ("APA") in view of Kimura et al (U.S. 6,407,004). For an obviousness rejection to be proper, the Examiner must meet the burden of establishing that all elements of the invention are disclosed in the prior art and that the prior art relied upon, coupled with knowledge generally available in the art at the time of the invention, must contain some suggestion or incentive that would have motivated the skilled artisan to modify a reference or combined references. *In re Fine*, 5 U.S.P.Q.2d 1596, 1598 (Fed. Cir. 1988); *In Re Wilson*, 165 U.S.P.Q. 494, 496 (C.C.P.A. 1970).

Claims 1-5 include the following element: "a first etching process is applied in which the electrode material layer is etched using gas containing fluorine or gas containing a mixture of fluorine and oxygen, and with the mask pattern as a mask to a degree wherein a portion of the electrode material layer remains; and a second etching process is applied in which the electrode material layer is etched using a gas containing a mixture of chlorine and oxygen." Neither APA nor Kimura teach or suggest those elements.

First, as indicated by the Examiner APA does not describe that the two types of etching processes using different gases are applied to the gate electrode, or that one of the two types of etching processes uses gas containing fluorine or gas containing a mixture of fluorine and oxygen and the other etching process uses gas containing a mixture of chlorine and oxygen, or that the etching process using "gas containing a mixture of chlorine and oxygen" is performed "after" the etching process using "gas containing fluorine or gas containing a mixture of fluorine and oxygen." In addition, Kimura includes no description or suggestion concerning the feature defined in claim 1 that when etching the gate electrode formed on the gae insulating film an etching process using "gas containing fluorine or gas containing a mixture of fluorine and oxygen" is first performed and then an etching process using "gas containing a mixture of chlorine and oxygen" is subsequently performed.

The Examiner states that Kimura discloses a first and second etching process for a gate electrode layer using fluorine, chlorine, and oxygen, and that it would have been obvious

to modify the process of APA to include the etching process which uses a gas containing mixture of chlorine and oxygen as suggested by Kimura.

However, Kimura explicitly describes, in the section of the "Background of the Invention," that an etching process applied to a gate electrode 43 made of tungsten (W) which is formed on a SiO_2 film 42, which uses Cl2 and O2 mixed gas is no preferable because the etching selection ration between the tungsten gate electrode and SiO2 is poor (see col. 1, lines 42-61), and Kimura does not therefore use the etching for the gate electrode which uses Cl2 and O2 mixed gas in the embodiments. Thus, considering this problem of poor etching selection ratio between a tungsten (W) gate electrode and SiO2 indicated by Kimura, one with ordinary skill in the art would have had no motivation for performing the etching process using a "gas containing mixture of chlorine and oxygen" at least as the final etching process of the gate electrode.

Accordingly, because APA and Kimura do not disclose all of the elements of claims 1-5, and there is no motivation to combine APA and Kimura to reach the claimed invention, the claims are patentable over the references. Accordingly, Applicant respectfully requests that the rejection be withdrawn as to claims 1-5.

With regard to claim 6, the Examiner states that APA discloses the forming of a gate electrode having a tapered shape by applying an etching process using gas containing fluorine or gas containing a mixture of fluorine and oxygen. However, as described the specification, the etching process using gas containing fluorine or gas containing a mixture of fluorine and oxygen, the etching selection ratio between the electrode material and the gate insulating film cannot be high, and therefore a portion of the gate insulating film is also etched when etching the electrode material.

As such, claim 6 includes the following element: "in the first etching process, an etching gas having a smaller etching selection ratio between the electrode material layer and the gate insulating film than an etching gas used in the second etching process and having a faster etching rate of the electrode material layer than the etching gas of the second etching process is used, and the electrode material layer is etched to a degree so that a predetermined thickness of the electrode material layer remains in regions not covered by the mask, and in the second etching process, an etching gas having a larger etching selection ratio between the electrode material layer and the gate insulating film than the etching gas used in the first etching process and having a larger ashing rate of the mask pattern than the etching gas used in the first etching process is used to etch the electrode material layer remaining in the predetermined thickness, so that a gate electrode having a tapered shape wherein the side

surface is inclined such that the width becomes narrower toward the upper surface is obtained."

APA does not describe use of the etching gases having the above-quoted relationship in the first and second etching processes. In particular, APA does not describe use of the gas having both characteristics (larger etching selection ratio and a larger ashing rate) in the second etching process

In Kimura (col. 8, lines 17-64, as indicated by the Examiner), the upper layer of the two-layer gate electrode is etched in the first etching process and the lower layer of the gate electrode is etched in the second etching process. However, Kimura merely selects, as the etching gas used in the first etching process, a material with a high selection ratio between the upper-layer electrode material which is an etching object in the first etching process and the lower-layer electrode material. Similarly, as the etching gas used in the second etching process, a material with a high selection ratio between the lower-layer electrode material which is an etching object in the second etching process and the gate insulating film formed below is selected. Thus, Kimura does not describe or suggest all that the etching gas used in the first etching process has a "smaller" etching selection ratio between the electrode material layer and "the gate insulating film" formed under the electrode material than the etching gas used in the second etching process. Also, Kimura does not teach or suggest that the etching gas used in the second etching process has a larger etching selection ratio between the electrode material layer and "the same gate insulating film" as described concerning the first etching process than the etching gas used in the first etching process and also has a larger ashing rate of the "mask pattern."

Accordingly, because APA and Kimura do not disclose all of the elements of claim 6, and there is no motivation to combine APA and Kimura to reach the claimed invention, the claim is patentable over the references. Accordingly, Applicant respectfully requests that the rejection be withdrawn as to claim 6.

Claims 7-15 include the following elements: "a first etching step for etching, in a reaction chamber of an inductively coupled plasma apparatus having an inductively coupled plasma source and a biasing source, at least a portion of the electrode material layer using a mask pattern formed on the electrode material layer as a mask and by activating only the inductively coupled plasma source; and a second etching step for etching, in a reaction chamber of the inductively coupled plasma apparatus, the electrode material layer which is etched in the first etching step by activating both the inductively coupled plasma source and the biasing source."

APA and Kimura do not teach or suggest the feature of controlling the inductively coupled plasma source and the biasing source in a reaction chamber of an inductively coupled plasma apparatus having the inductively coupled plasma source and the biasing source in accordance with the etching process for performing different etching processes as claimed.

Accordingly, because APA and Kimura do not disclose all of the elements of claims 7-15, and there is no motivation to combine APA and Kimura to reach the claimed invention, the claims are patentable over the references. Accordingly, Applicant respectfully requests that the rejection be withdrawn as to claims 7-15.

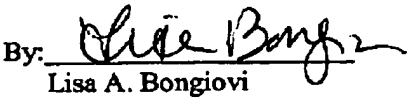
Applicant has also added claims 21-23. Because each of the claims includes all of the elements of claims 1, 6, and 7, respectively, the claims are allowable for the reasons discussed above. Accordingly, Applicant respectfully requests that claims 21-23 be allowed.

In view of the foregoing, it is respectfully submitted that the instant application is in condition for allowance. Accordingly, it is respectfully requested that this application be allowed and a Notice of Allowance issued. If the Examiner believes that a telephone conference with Applicant's attorneys would be advantageous to the disposition of this case, the Examiner is cordially requested to telephone the undersigned.

In the event the Commissioner of Patents and Trademarks deems additional fees to be due in connection with this application, Applicant's attorney hereby authorizes that such fee be charged to Deposit Account No. 06-1130.

Respectfully submitted,

CANTOR COLBURN LLP

By: 

Lisa A. Bongiovi
Registration No. 48,933
CANTOR COLBURN LLP
55 Griffin Road South
Bloomfield, CT 06002
Telephone (860) 286-2929
Facsimile (860) 286-0115
Customer No. 23413

October 6, 2004